

GCMS CRA Report

Test Date	18-Dec-2014
CUSTOMER	IINO MARINE SERVICES
VESSEL NAME	TOYOSU MARU(IMO: 9134294)
PORT OF BUNKERING	BALBOA-PANAMA
BUNKER DATE	13-Dec-2014
VISWA LAB LOG #	H141208381
SEAL #	0355118

Compound	Units	8381U
Halogens:		
1,1-Dichloroethene	ppm wt	< 2
Methylene chloride	ppm wt	< 2
Allyl chloride	ppm wt	< 2
trans-1,2-Dichloroethene	ppm wt	< 2
1,1-Dichloroethane	ppm wt	< 2
cis-1,3-Dichloroethene	ppm wt	< 2
2,2-Dichloropropane	ppm wt	< 2
Bromochloromethane	ppm wt	< 2
Chloroform	ppm wt	< 2
1,1,1-Trichloroethane	ppm wt	< 2
1,2-Dichloroethane	ppm wt	< 2
1,1-Dichloropropene	ppm wt	< 2
Carbon tetrachloride	ppm wt	< 2
1,2-Dichloropropane	ppm wt	< 2
Trichloroethylene	ppm wt	< 2
Dibromomethane	ppm wt	< 2
Bromodichloromethane	ppm wt	< 2
cis-1,3-Dichloropropene	ppm wt	< 2
trans-1,3-Dichloropropene	ppm wt	< 2
1,1,2-Trichloroethane	ppm wt	< 2
1,3-Dichloropropane	ppm wt	< 2
Dibromochloromethane	ppm wt	< 2
1,2-Dibromomethane	ppm wt	< 2
Tetrachloroethylene	ppm wt	< 2
Chlorobenzene	ppm wt	< 2
1,1,1,2-Tetrachloroethane	ppm wt	< 2
Tribromomethane	ppm wt	< 2
1,1,2,2-Tetrachloroethane	ppm wt	< 2
1,2,3-Trichloropropane	ppm wt	< 2
Bromobenzene	ppm wt	< 2
1-Chloro-2-methylbenzene	ppm wt	< 2
1-Chloro-4-methylbenzene	ppm wt	< 2
Pentachloroethane	ppm wt	< 2
1,3-Dichlorobenzene	ppm wt	< 2
1,4-Dichlorobenzene	ppm wt	< 2
1,2-Dichlorobenzene	ppm wt	< 2

1,2-Dibromo-3-chloropropane	ppm wt	< 2
1-Chlorobutane	ppm wt	< 2
Dichlorotoluenes	ppm wt	< 2
Hexachloroethane	ppm wt	< 2
Trichlorobenzenes	ppm wt	< 2
Aromatics:	Units	8381U
Benzene	ppm wt	< 20
Toluene	ppm wt	215
Ethylbenzene	ppm wt	149
m+p-Xylene	ppm wt	734
o-Xylene	ppm wt	348
iso-Propylbenzene	ppm wt	33
n-Propylbenzene	ppm wt	138
1,3,5-Trimethylbenzene	ppm wt	319
1,2,4-Trimethylbenzene	ppm wt	1165
Naphthalene	ppm wt	1373
Methylnaphthalenes	ppm wt	7407
C2-Naphthalenes	ppm wt	11397
Reactives:		
Styrene	ppm wt	< 20
Indene	ppm wt	< 20
DCPD	ppm wt	< 20
DH-DCPD	ppm wt	< 20
Methylstyrenes	ppm wt	< 20
C2-Styrenes	ppm wt	< 20
alpha-Methylstyrene	ppm wt	< 20
4-Vinylcyclohexene	ppm wt	< 20
Oxygenates/Solvents:		
1-Butanol	ppm wt	< 20
Cyclohexanol	ppm wt	< 20
2-Butoxyethanol	ppm wt	< 20
Butoxybutanol	ppm wt	< 20
Phenol	ppm wt	< 20
Methylphenols	ppm wt	< 20
C2-Phenols	ppm wt	< 20
C3-Phenols	ppm wt	< 20
1-Phenylethanol	ppm wt	< 20
2-Phenylethanol	ppm wt	< 20
2-Phenyl-1-propanol	ppm wt	< 20
1-Phenoxy-2-propanol	ppm wt	< 20
2-Phenoxyethanol	ppm wt	< 20
Ethylene glycol	ppm wt	< 20
Propylene glycol	ppm wt	< 20
Styrene glycol	ppm wt	< 20
Glycerine	ppm wt	< 50

Resorcinol	ppm wt	< 20
Methylresorcinols	ppm wt	< 20
C2-Resorcinols	ppm wt	< 20
Methyl methacrylate	ppm wt	< 20
n-Butyl methacrylate	ppm wt	< 20
alpha-Pinene	ppm wt	< 20
beta-Pinene	ppm wt	< 20
Limonene	ppm wt	< 20
alpha-Terpineol	ppm wt	< 20
n-Butyl acrylate	ppm wt	< 20
1,4-Dioxane	ppm wt	< 20
Acetophenone	ppm wt	< 20
n-Butyl ether	ppm wt	< 20
2-Ethylhexanol	ppm wt	< 20
1-Heptanol	ppm wt	< 20
1-Octanol	ppm wt	< 20
1-Nonanol	ppm wt	< 20
1-Decanol	ppm wt	< 20
Bisphenol A	ppm wt	< 20
FAMES (Biodiesel):		
C14:0 FAME	ppm wt	< 20
C16:0 FAME	ppm wt	298
C18:0 FAME	ppm wt	255
C18:1 FAME	ppm wt	1594
C20:0 FAME	ppm wt	< 20
Additional Non-Calibrated Compounds:		

COMMENTS:

GCMS CRA indicated the presence of below mentioned contaminants:

CONTAMINANTS	UNITS		NORMAL
C16:0 FAME	ppm wt	298	< 20
C18:0 FAME	ppm wt	255	< 20
C18:1 FAME	ppm wt	1594	< 20

1. Total FAME content adds up to 2147 ppm (normally less than 100 ppm)

Presence of FAME (BioDiesel) could be from waste/offspec/unstable biodiesel products. These organic substances could have the effect of damaging lubrication film between rubbing parts causing high wear and tear. Empirical studies performed at Viswa Lab has indicated that the when total FAME content is above 300 ppm problems are likely to occur. This fuel had 2147 ppm of FAME's in it.

Please note that these observations are made on the basis of a limited sample sent to us, on the basis that the sampling has been done correctly and our carrying out various tests using this sample in the lab.